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HÆMORRHAGIC SMALLPOX.

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SINCE 907 A.D., when Elfrida, daughter of Alfred, king of England, recovered from an attack of variola, then first so called, individual cases of smallpox have been always present in the world, and these single scattered cases are not usually at present very severe. Previous to the introduction of vaccination, however, these cases presented themselves as a universal and chronic epidemic, and Alexander Crichton, imperial physician in Russia in 1768, reported that up to that year every seventh child died annually from smallpox (*Moore's Hist. of Smallpox*, p. 286). With such a general average as this, a relative epidemic occasioned fearful ravages, and we find accordingly two million deaths in one year in Russia alone (Woodville, *Smallpox*, p. 292).

Even at present, at different times, over a greater or less extent of country, from unknown causes, the intensity of the poison, or the receptivity of mankind for the virus, or both, appears to be increased, and the result is an epidemic of the disease. These epidemics are more common in the warm months, but may appear at any season, During the prevalence of an epidemic of variola, individual cases tend to assume a graver type than usual, and we see specimens of the perconfluent, corymbose and hæmorrhagic varieties. The epidemic at present existing has been especially characterized by the occurrence of a relatively disproportionate number of cases of the most severe form of variola, the hæmorrhagic, so that many, even old physicians, have now encountered this variety for the first time. Nor only with us. For over a year the European journals have teemed with reports of such cases. Dr. Lothar Meyer (*Bericht an die Königl. Sanitäts Comission*) reports from Jan. 1st to July 20th, 1870, 8 cases of variola hæmorrhagica among 287 cases of smallpox in Berlin; and from Aug. 10th to Dec. 31st, 1871, 111 such cases among 1293 of smallpox (*Deutsche Klinik*, No. 44, 1872). In Trinidad, where the epidemic has raged since May, 1871, Dr. Bakewell reports his smallpox hospital at Port of Spain, as frequently full of confluent and hæmor-

rhagic cases. The males of mixed Spanish and Indian blood, imperfectly vaccinated or unvaccinated, all died, without exception, from such attacks of the severest kind (*Med. Times and Gazette*, vol. ii. No. 1162, Oct. 5th, 1872). The question then presents itself, what is hæmorrhagic smallpox, and why is it with justice so called?

We are all familiar with the appearance of pocks, the contents of which are stained red or even black by the admixture of blood. To these should be applied the term variolæ cruentæ. This form is not true variola hæmorrhagica, though variola nigra is the name frequently applied to it. Such pustules are most common on the plantar and volar aspects of the feet and hands. There is no general affection of the capillaries and no consequent general extravasation of the blood. The process is one of local inflammation. Nor must we confound with variola hæmorrhagica the frequent ecchymotic prodromal forms occurring especially upon the abdomen, more often met with in women than in men, and consisting of purpuric spots often accompanied by an abundant eruption of petechiæ, and fading by the fourth day to a dirty yellow color (*Prag. Vierteljahrsch't*, xxi. 1872). Often, especially in old age, and particularly upon the lower extremities, we may notice hæmorrhagic efflorescences, and at the same time there may be present slight hæmaturia, epistaxis and ecchymosis of the conjunctivæ, but the disease runs otherwise its normal course. So too, in the stage of desiccation, pustules may encroach upon each other and join to form large bullæ, which fill themselves often with fluid blood. These various appearances do not portray true variola hæmorrhagica. Now let us see what this really is.

History.—Our acquaintance with the subject of this paper may be considered as dating from Sydenham's account of the intermittent epidemic of smallpox in London, from 1667 to 1681, inclusive. He speaks of "an anomalous black smallpox in 1670," and from this year to 1681 the disease increased in severity until in the latter year there occurred a species which he calls "pessimæ," in which "purple spots frequently preceded the eruption or were occasionally the harbingers of death, with a discharge resembling blood from the bladder, when little or no eruption had taken place." Sanders, in a work published in 1813, describes a form of sanguineous smallpox, causing death in one or two days, "blood often flowing copiously from the mouth, nose, eyes, or any passage, particularly the kidneys, bladder and uterus." From this latter date the disease smallpox has been admitted to manifest itself at times under the form of variola hæmorrhagica. But it is only recently that this variety has been thoroughly studied histologically as well as clinically.

Varieties.—The hæmorrhagic form of smallpox admits of but two sub-divisions, and these are rather stages of intensity than differences in form. In the first stage the extravasation into the skin and the hæmorrhage from the mucous membranes is so intense that the patient usually dies on the second or third day, before other symptoms

can be developed. When the patient lives long enough for the disease to pass into the second stage, true pustules will form and the petechiæ of the first day, which by the second or third day have turned to purple papules, and are most numerous upon the face, lose their blood and become filled with yellow pus, the surrounding skin appearing livid. With regard to clinical appearances we may perhaps admit two varieties, the papular form, broad and flat, but slightly raised above the level of the surface of the skin, colored centrally or peripherally or throughout of a dark red or black color, and possessing a true umbilication or central depression; and secondly, the purpuric form, occurring alone or combined with the papular, not raised, covering almost any extent of surface, and usually of a purplish-red color, though varying from vermilion to coal black.

DEFINITION.—Variola hæmorrhagica may be defined as an intensification of the first stage of smallpox, characterized by the prodromal exanthem to such a degree that death ensues before sufficient time has elapsed for the disease to enter upon its second stage, the integuments, external and internal, being universally affected and so markedly that the distended capillary bloodvessels no longer serve as normal, unbroken channels for the blood.

ETIOLOGY.—Clinically speaking this variety may take its origin by contagion from any variety of variola, as is shown by cases occurring in this city, in Berlin and in Hamburg, where Simon reports a case of variola hæmorrhagica due to contagion arising from variola sine variolis in a sister. Scientifically it is due to an exaggeration of the causes producing the prodromal exanthem, which latter results from a paresis of the vaso-motor nerves of the capillaries in the region affected (*Knecht. Arch. f. Derm. u. Syph. Heft* ii. 1872). This exaggeration is less attributable to strength of attack than to weakness of defence, as variola hæmorrhagica usually occurs only where the patients were unvaccinated (Bucquoy. *Report on Smallpox at Cechin, France*), though this is doubted by Knecht, and cachectic or suffering from chronic nervous trouble (Aikmann's *Glasgow Med. Jour.*, iv. new ser.), with tissues badly nourished by the debilitated trophical nerves, and capillaries with degenerated walls. Furthermore it is most common between the ages of fifty and sixty years, and more frequent in women than in men. Just so in scarlet fever, the hæmorrhagic form occurs only when the patient is in wretched physical health before the attack (Bohn. *Blutiger Scharlach Jahrb. f. Kinderheilk.* 1869, No. 4). Even in previous conditions of so called health we find, by means of the sphygmograph, in those who subsequently are attacked by the hæmorrhagic form of variola, an abnormal and defective action of the muscles of the vessels. That the nervous and capillary systems are affected by simple variola is shown by the brain symptoms, the occurrence of herpes zoster, and of paralyses (Wolff, *Alg. Zeitsch. f. Psychiatrie*, B. 24–26), and of the concurrence of the menses with the eruption, even when they have apparently ceased forever (Knecht, *loc. cit.*).

Locality.—The seat of variola hæmorrhagica, especially of the papular form, is usually the abdomen, which in common cases of variola often enjoys a certain immunity; then the lower limbs and back. The purpura form prefers, next to the abdomen, the eyelids.

Course, Characters and Symptoms.—The period of *incubation* is the same for variola hæmorrhagica as for the other forms of smallpox. This is well shown by a case of Dr. Meyer's in Berlin, where a woman in the sixth month of pregnancy, who, on account of trouble in her legs, never left the house and saw no company, was infected by her husband who had varioloid, fell sick thirteen days later than he, and showed, after a three days prodromal stage, the purpura form of variola hæmorrhagica. The *prodromal symptoms* may be prolonged, the hæmorrhagic symptoms nevertheless making their appearance and death ensuing before the perfect development of the pocks. Or the prodromal symptoms may run their usual course and the eruption of vesicles appear, accompanied by most severe constitutional symptoms; then, after a day or two, the disease assumes the hæmorrhagic type and the death of the patient may be deferred for several days more. In cases belonging to the first class pain in the back and exhaustion are soon noticed. Then, with usually a moderate fever, there appears a redness affecting preferably the same localities as those of the usual prodromal exanthem, but which may cover the whole body, and which soon takes on a bluish color. The pain in the back is now so severe that sleep is interfered with and narcotics exercise merely a temporary influence. The next day commonly shows the hæmorrhagic appearances, with swollen conjunctivæ and effusions under the choroid membranes, sometimes producing total blindness. Metrorrhagia, epistaxis, hæmaturia, and bloody stools now occur. The pharynx, larynx and hard and soft palates become thickly coated with a diptheritic exudation, dyspnœa sets in, the voice is lost and the breath has a disgusting sour smell. A general extravasation of blood into the tissues and from the mucous membranes now takes place, and soon death ensues, previous to which the pocks often appear as very minute vesicles, but undergo no further development.

In cases of the second class, above mentioned, the initial fever is very severe, not remitting even at the completion of the eruption, the temperature merely sinking somewhat in the morning. After two to eight days of great suffering, especially of the larynx and throat, delirium supervenes, with extravasation of blood into the pocks and the skin generally, and from the mucous membranes, frequently accompanied also by extensive infiltration of the lungs. Death now ensues at about the third or fourth day, the patient being at the time unconscious.

Diagnosis.—Practically, it is not difficult to recognize variola hæmorrhagica, occurring as it does during an epidemic of smallpox, but scientifically it is only by a differential diagnosis, by the careful

elimination of several affections which to the eye closely resemble it, that we can arrive at certainty of conviction with regard to its presence. Prodromal exanthems, and the other forms of slightly hæmorrhagic nature already referred to, are first to be eliminated. We must remember the possibility of ecchymoses and extravasations in the other exanthemata, e. g. scarlet fever (Frazer. *Edin. Med. Jour.*, xviii. p. 180, Aug., 1870). The coincidence or succession of various exanthemata must be borne in mind (Fleischman. *Arch. f. Derm. u. Syph.*, iv. 2, p. 223). So the occurrence of other diseases with variola, e. g. typhus fever (Simon. *Berl. Klin. Woch't.*, No. 11, 1872). We must not forget that hæmorrhages occur in other diseases not of an exanthematous nature (Thiry. Scorbut. *Presse Méd.*, xxiv. 35). Variola hæmorrhagica may also vary in minor points at various times and places, according to idiosyncrasies or circumfusa (Cantel. *Bull. de Thér.*, lxxxiii. p. 224) (Rocher. *Gaz. Hebd.*, 2d Ser., ix., 32, p. 523). Finally, we must consider the characteristics peculiar to the disease itself (Foot. Hæmorrhagic Smallpox. *Dubl. Jour.*, liv., July, p. 68).

The diseases most apt to be confounded with the form of smallpox in question are the purpuræ, rheumatic and hæmorrhagic. But the former, first described by Schönlein as peliosis rheumatica, occurs in the strong and healthy or in those chronically affected with rheumatism, is never found in children or aged persons, is more common in men than women, begins with pains in the joints which subside when the small livid spots appear, and the prognosis is favorable. [Vide Bradbury. Peliosis Rheumatica. *Brit. Med. Jour.*, Sept. 7th, p. 274.] Purpura hæmorrhagica may more readily be mistaken for variola hæmorrhagica, and the purpura febrilis of Willan was probably now one and now the other of these two diseases. Both begin with exhaustion and headache, but in the latter there is pyrexia, and the pulse may go up to 140; in the former, the pyrexia is slight or absent. The prodromal stage of the purpura is more prolonged. The maculæ appear first on the lower extremities, whereas in variola these occur first about the navel and spread over the body. In the former these maculæ may be an inch or more in diameter, with interspersed or scattered petechiæ. In the latter they are petechiæ, changing, on the second or third day, to purple papules. In the former we notice successive crops of maculæ, some fading as others appear, and a vulnerability of the skin such that even a slight pressure produces an ecchymosis. In the latter we find a general cyanosis, due to hæmorrhage into the lungs and consequent impeded respiration. In the former metrorrhagia is rare, in the latter very frequent. In the former, hæmorrhage gives at first a sensation of relief, but the patient dies, finally exhausted by loss of blood, and often with œdema of the feet and ascites. In the latter, death supervenes without such appearances (Hebra. *Hautkrankheiten*, Bd. i. p. 619).

The possible occurrence of appearances not as yet described must not be left out of consideration. Thus, Dr. Bedo Wenzel (Fälle eigenartiger Exantheme. *Arch. f. Derm. u. Syph.*, iv. I., p. 79, 1872) reports three cases of exanthemata varying from typical classified maladies and from each other. In each there was a tendency to hæmorrhagic effusions, referable, the author thinks, to the influence of the smallpox epidemic then ruling, this magnifying other exanthemata as well as predisposing to severity of type in the disease itself. The first case reported resembled rheumatic purpura in its clinical history, but the exanthem consisted of pale red roseolæ, generally with prominent central petechiæ; whereas in rheumatic purpura, the spots formed by extravasated blood are dark red, usually flat, and, when they first appear, show a slight congested halo. Nor was it hæmorrhagic purpura, which begins with exhaustion and fatigue, for the first symptom was marked pyrexia. The second case was one wherein smallpox followed immediately an acute ecthymatous exanthem, this latter immediately succeeding a recovery from scarlet fever. The third case resembled pemphigus, but the bullæ were flat and accompanied by spots and bands, most of which disappeared without changing to bullæ. Some of the bullæ also were filled with blood. There were no relapses and no general symptoms (Neubert. *Schmidt's Jahrb.*, 155, No. 9, 1872).

Prognosis.—Variola hæmorrhagica is almost unexceptionally a fatal disease. A few writers report recoveries after what they have considered as a purely papular form uncombined with purpuric appearances.

Treatment.—It follows, from the prognosis, that we can expect but little from treatment. Quinine may be given. So also hæmostatics, as plumbi acetas for internal bleeding, and ergot for metrorrhagia. Stimulants, too, may be administered when collapse is threatening.

Pathology.—Autopsies, in cases of variola hæmorrhagica, show numerous post-mortem extravasations into the integuments of the body, and the tendency is towards rapid decomposition and putrefaction. Examination of ante-mortem suggillations shows that they penetrate the sub-connective cellular tissue and even the muscles sometimes to the bones. The *brain* may be anæmic or strewn with spots of blood. The vessels of the pia mater are often twisted and crowded with dark blood. Hæmorrhagic pachymeningitis may exist, and even extravasations into the arachnoid. The *trachea* often shows a diphtheritis which may extend downwards to the bronchi or outwards peripherally from the larynx to almost any extent. The serous membranes of the *pleura, pericardium and peritoneum* are covered with purpuric spots. The *lungs* are usually œdematous and hypostatically hyperæmic; in rare cases an extended lobular pneumonia may exist. The *heart* is filled with dark red blood, the endocardium covered with petechiæ, and the muscles sometimes rather

fattily degenerated. The *liver* is enlarged, with fatty degeneration of its acini, especially in the purpuric form of variola hæmorrhagica. The *spleen* is often enlarged as in common variola, but in the purely purpuric form is small and tough and contains thrombi. In the papular form the spleen is of about the normal size. The mucous membranes of the *stomach* are covered with extravasations often extending into the intestines.

The *kidneys* are the most frequently and severely affected of all the organs. They may be doubled in size at the expense of the cortical substance, and show all the signs of acute parenchymatous inflammation. Nephritis of both kidneys may exist. A diphtheritis or hæmorrhagic catarrh may cover the whole pelves, and the ureters and bladder may be filled with blood (*Unruh. Blutungen in Nierenbecken u. Ureteren bei pocken. Arch. d. Heilk.* xiii. 4 u. 5, p. 289). A similar hæmorrhagic catarrh of the *uterus* often exists, and the mucous membrane of the large intestine is sometimes so infiltrated that the application of a stream of water to clean it washes it entirely away, leaving the serous layer bare.

HISTOLOGY.—The substance and texture of the tissues and the blood in smallpox have not been neglected by microscopists. Twelve years ago, Auspitz and Basch (*Virchow's Arch., Bd.* xxviii.) described the results of their investigations in this direction, and spoke of the early stage at which the bloodvessels were affected. On the second day of the eruption, the vessels of the corium, both papillary and deeper layers, were enlarged and their walls surrounded by numerous thickly-crowded, small, round cells. This condition of the vessels becomes more marked with the intensity of the disease. Accordingly Pribram (*Viertelj. sch't. f. d. prak. Heilk.*, iii. p. 27) calls attention to the fact that this condition is found magnified in degree in the earlier stages of variola hæmorrhagica. Red blood corpuscles accompanying the loaded capillaries in the deeper layers of the corium next heap themselves up and pervade all the layers of the corium and of the epidermis, at a period earlier than the formation of the white corpuscles going to fill the usual vesicles of variola (Wagner. Epithelial blutungen. *Arch. d. Heilk.* ix. p. 505, 1868). The origin of these red corpuscles may be traced to a thinning of the walls of the capillaries. Erismann also has examined the skin in variola hæmorrhagica (*Sitzungs b. d. Wien. Akad.* 1868), but his views have not stood the test of comparison with the more extended labors of others. So Ebstein, who first called attention to the fan-like partition walls within the variolous vesicles (*Virchow's Arch.* xxxiv.). Prof. Wyss, of Zurich, has made perhaps the most recent extended researches in this direction (*Arch. f. Derm. u. Syph.* 1871, p. 529) (*Centr'b. f. d. Med. Wissensch.* 1872 17–27). As the result of his investigations, he is in accord with Wagner that the blood corpuscles pass through thinned, and not ruptured, capillary walls. He agrees also with Wagner that the blood corpuscles leave their usual capillary paths

at the apices of the papillæ of the corium and wander into the upper layers of the rete Malpighii, but he does not thus restrict, like Wagner, the location of their post of emigration. They depart, he says, also, from the capillary meshwork beneath the base of the papillæ and even from the deeper layers of the corium. Here the extravasation is not always continuous, but broken into separate groups of blood corpuscles. More superficially the corpuscles lie so thickly as to touch each other, and a cross section of an ecchymosis extends often two millimetres in depth. Where blood is extravasated into vesicles already formed, it is not confined to one of the compartments, but may pervade all, especially the deeper ones. [Vide also Ponfick. Ueber die anatomischen Veranderungen der inneren organe bei hæmorrhagischen und bei pustulörer Variola. *Berlin Klin. Wochensch.*, ix. 42, p. 508.]

We believe that we have shown, at least, the propriety of the term variola hæmorrhagica. It only remains for us to warn against the use of the term purpura variolosa. No disease should ever be adjectivally christened by the appellation of a distinct morbific process, however similar may be the clinical appearances. Carelessness of this description, added to French verbosity and English hair-splitting, has done too much towards producing confusion in dermatological nomenclature. There is a purpura hæmorrhagica; there is a variola hæmorrhagica, subdivided into papular and macular forms. There is no purpura variolosa, and the term variola purpuraformis is, to say the least, superfluous.

24 *Charles Street*, Dec. 1872.

Progress in Medicine.

REPORT ON MEDICAL CHEMISTRY.

By Edward S. Wood, M.D.

(Concluded from page 18.)

New Reagent for Antimony.—Hugo Tamm, in the *Chem. News*, No. 623, recommends a new reagent for the precipitation of antimony, which promises to be useful, not only in the qualitative and quantitative analysis of this metal, but also in the analysis for its detection in toxicological cases. This reagent is gallic acid, and it can be used not only for the quantitative determination of antimony when alone, but also when in combination with arsenic, tin, or with both together. When a slight excess of gallic acid is added to a neutral, or feebly acid concentrated solution of antimonous chloride (terchloride of antimony), all of the metal is precipitated as the bi-gallate, forming a very white precipitate, which settles readily and can be easily washed with hot water by decantation. The solution of gallic acid used should be freshly prepared, for by standing a few days it becomes so altered as to be unfit for the precipitation of antimony. The solution

containing the antimony should also be previously prepared for the addition of the gallic acid by evaporation, in order both to expel all, or nearly all, of the free acid, and to concentrate the solution. The precipitate then formed by the addition of the gallic acid, when washed and dried at 100° C., contains exactly 40·85 per cent. of metallic antimony. This reagent will only separate antimony from its solutions when the latter exists in the form of antimonous or terchloride, solutions of antimonic or perchloride being unfit for the estimation by gallic acid; but we have in iodide of potassium a reagent which very readily reduces the antimonic to the form of antimonous chloride, potassic chloride and free iodine being simultaneously formed, as represented in the following reaction:—$Sb_2 Cl_5 + 2 KI = Sb_2 Cl_3 + 2 K Cl + I\text{-}I$. Gallic acid is especially applicable in estimating the amount of antimony in either the native or the artificial sulphide when the latter is mixed with the other sulphides, as is often the case in the analysis of a liver or stomach in toxicological cases, or even in an ordinary analysis, the sulphide of antimony being obtained mixed with a large amount of free sulphur, or contaminated with the sulphides of arsenic or copper. The method of treating such a precipitate is, to dissolve it in hydrochloric acid with the addition of a little potassic chlorate if necessary, to add to this solution one of iodide of potassium until no more free iodine is formed, which reduces antimonic to antimonous chloride; then to concentrate by evaporation, and to precipitate the antimony with a solution of gallic acid. This precipitate can be washed, dried and weighed, the antimony being thus estimated directly. In the filtrate we have all of the other metals as chlorides. By this method we can easily separate antimony from arsenic, which is very difficult by other processes. The bi-gallate of antimony thus obtained can afterwards be dissolved in hydrochloric acid, and the solution subjected to confirmatory tests if desirable.

Test for detecting Arsenious Acid in the presence of Arsenic Acid and Tartar Emetic.—(Pharm. Centralhalle, xii. p. 157.) H. Hager recommends the following test for arsenious acid, which, as will be seen, is the same as Marsh's test, with the exception that potassic hydrate is used instead of sulphuric acid.

If a solution of arsenious acid in pure potassic hydrate be heated gently in a test tube with a few pieces of pure zinc, until an evolution of gas takes place, and a piece of parchment paper which has been moistened with a solution of nitrate of silver be introduced into the mouth of the test tube, the paper will become colored dark brown on account of the decomposition of the nitrate of silver by the arseniuretted hydrogen which escapes. The presence of organic matter does not interfere with this test, and the evolution of gas is rendered more active by the introduction of a few pieces of pure magnesium with the zinc.

If arsenic acid, oxide of antimony, or tartar emetic be treated in the same way, no arseniuretted or ammoniuretted hydrogen is evolved, but only pure hydrogen; hence no coloration of the nitrate of silver paper is produced. In the case of antimony compounds, the antimony is deposited in the metallic form in the test tube. If arsenious acid is mixed with the compound of antimony, it is not decomposed by the nascent hydrogen until all of the antimony present has been deposited; but as soon as this result has been accomplished, the paper becomes

colored by the arseniuretted hydrogen evolved. This fact can be utilized in the detection of arsenious acid as an impurity in tartar emetic. Care must be taken not to allow the nitrate of silver paper to touch the side of the test tube, else it may become colored by the action of the potassic hydrate. In testing five to seven grains of tartar emetic for arsenious acid, the potassic hydrate solution and zinc should be warmed gently in a water bath for one or two hours, by which time all of the antimony will be separated in the metallic form, and the arsenious acid, if present, be detected by the coloration of the nitrate of silver paper.

Estimation of Arsenic.—Dr. John C. Draper, in the *American Chemist* (June, 1872), describes a modified Marsh's apparatus for the quantitative determination of arsenic which is particularly well adapted for toxicological investigations. By means of this modified Marsh's test, the arsenic is obtained in the metallic state and can be directly weighed.

In consequence of the difficulty of obtaining zinc perfectly pure, he recommends an apparatus by which metallic magnesium can be used, if it is impossible to obtain zinc free from arsenic and antimony. This apparatus consists of a glass tube about one inch in diameter, the lower end of which is drawn out and curved upwards like the curve of the letter U. This bend is then filled with mercury, through which a ribbon of metallic magnesium can be passed into dilute sulphuric acid, and the amount of hydrogen gas evolved regulated by the amount of magnesium pushed through the mercury. The upper part of the tube is arranged in the same manner as the neck of the flask in an ordinary Marsh's apparatus. When pure zinc can be obtained, it can be used in the ordinary flask.

Now, in order to obtain the whole of the arsenic in such a form that it can be weighed without loss, and can subsequently be tested, Dr. Draper uses a hard glass tube one-fourth of an inch in diameter, drawn out at one point so as to form a tube two inches long and one-tenth of an inch in diameter, into the narrow portion of which is dropped a previously weighed faggot or bundle of clean platinum wire, so that it fits closely. This tube is again drawn out at another point, and finally bent so that the end dips into a solution of nitrate of silver. To use the apparatus, hydrogen is generated by means of the magnesium (or zinc) and dilute sulphuric acid, dried by passing through a tube filled with chloride of calcium, and passed through the tube into the nitrate of silver solution. A Bunsen flame is applied to the second point at which the tube is drawn out. If no deposit appears beyond the flame, and no decomposition of the nitrate of silver solution takes place, the apparatus and reagents may be pronounced pure. The arsenical solution can then be introduced in the ordinary way, and a Bunsen flame, from a burner having an elongated opening one-sixteenth of an inch wide and one inch long, is applied to the portion of the tube which contains the platinum. *The platinum unites with all of the arsenic*, even though the arsenical solution be strong and the evolution of the gas rapid. In order to determine when all of the arsenic has been removed from the solution, the gas can be tested by removing the elongated burner for a few moments. If arseniuretted hydrogen is still being evolved, a stain will appear beyond the lower flame. If none appears, all of the arsenic has been deposited on the platinum,

which can then be removed from the tube and weighed. The arsenic can be separated from the platinum by heating the latter in a tube through which dried oxygen gas is made to pass, and the end of which dips into boiling distilled water. It is thus converted into arsenious oxide, most of which condenses in the cold part of the tube, and can be examined by the ordinary methods.

Chemical Action of Oleum Terebinthinæ on Phosphorus.—Köhler states (*Chem. Centralbl.*, 1871, p. 68) that the antidotal action of impure oil of turpentine, i. e., that which contains oxygen and water, upon phosphorus depends upon the fact that the phosphorus is oxidized, and unites with the turpentine to form a crystalline substance having acid properties and termed by him "turpentine phosphorous acid." This substance unites readily with some of the bases to form salts which have a definite composition. It does not act as a poison when administered to animals in doses of from 0.3 to 0.03 grammes (one-half to four and a half grains), but is absorbed and eliminated in part at any rate by the kidneys, imparting to the urine a camphor-like odor, and it can be recovered from the urine by distillation, being detected in the distillate by its reducing power, it readily reducing corrosive sublimate to calomel, or nitrate of silver to metallic silver. If we allow the distillate to remain exposed to the air for several days, or treat it with oxydizing agents, oxygen is absorbed and phosphoric acid can be detected by applying the proper tests. Chemically pure oil of turpentine dissolves phosphorus upon the application of a gentle heat, but deposits it again unchanged, and not in the form of turpentine phosphorous acid, upon cooling. Pure oil of turpentine, therefore, is not an antidote for phosphorus.

Analysis of Animal Tissues for Curarin.—Dr. Karl Koch, in the *Chem. Centralbl.* (1871, p. 232), highly recommends the three following chemical tests for curarin, by means of which it can readily be detected in the urine and fæces after the administration of a therapeutical dose. He acknowledges at the same time that in medico-legal cases the most reliance is placed upon the physiological test on animals. 1. Concentrated sulphuric acid produces in $\frac{1}{4}$ to $\frac{1}{2}$ c.c. of a solution containing .06 milligramme ($\frac{1}{1000}$ grain) an immediate red color, which becomes darker on standing, and in four hours is changed to a rose red, which color remains permanent for about two days. 2. Dilute sulphuric acid (one part of acid to fifty of water), added to the above solution and evaporated on a water-bath, is colorless at first, but upon concentration becomes first reddish, then purple, and finally black. If removed from the water-bath when the color is purple, it retains this color for several hours. If to this colored fluid potassic bichromate be added, the color disappears. 3. The most common test for strychnia, namely, concentrated sulphuric acid and potassic bichromate, when applied to a solution of curarin which contains $\frac{1}{500}$ grain, gives first a brownish-red color, which changes quickly to a blue and finally becomes red, the last color remaining permanent for several hours or even days. Curarin differs from strychnia, therefore, in the more rapid change from the beginning to the formation of the red, and in the permanency of the red.

From the results of many experiments, Dr. Koch has arrived at the following conclusions in regard to curarin: 1. That the physiological action of curarin is no more powerful than an equal dose of the curare

from which it was prepared. 2. That curarin can be detected by chemical reactions not only after death in cases of fatal poisoning, but also during life after the administration of curare in non-fatal doses. 3. In cases which end fatally, curarin can be detected in the urine and in all of the viscera. He succeeded but once in detecting it in the blood. 4. In non-fatal cases, or cases of chronic poisoning, it can be detected in the vomitus, urine and fæces; in the latter after subcutaneous injection. 5. That curarin is eliminated from the system unchanged. 6. That the first symptoms of its action appear in cats, when a fatal dose has been administered *per os*, in about forty-five minutes, and then it can be detected in every part of the intestine. 7. That it is probably passed into the intestine with the bile, since it can be detected in the fæces, after subcutaneous injection, in cases which do not terminate fatally. And since extracts obtained from the liver react more powerfully both chemically and physiologically than those obtained from other organs, and since it can be detected for several days in the fæces after the cessation of its administration, that it probably accumulates in the liver, and is gradually eliminated from it. 8. That the liver, stomach, heart and lungs are the organs which in medico-legal cases should be taken for analysis.

Dr. Koch prefers the method of Dragendorff for the extraction of the alkaloid from the tissues and fluids of the body.

On the Use of Phenol (Carbolic Acid) in the Analysis of Tissues for Curarin and Narcein in Medico-Legal Cases.—F. Solomon proposes (*Fres. Zeit.*, x. p. 454) a modification of Dragendorff's process for the extraction of these alkaloids, based upon their solubility in phenol. The tissues are first extracted with acidulated alcohol, the alcoholic extract evaporated to dryness, and the residue treated with water. The aqueous solution, after being made alkaline with potassic hydrate, is shaken successively with ether and amyl alcohol. A small portion of the narcein is dissolved by the amyl alcohol, but by far the larger part remains in the water. The alkaline solution is now neutralized with sulphuric acid and shaken with an equal volume of phenol. The two liquids quickly separate, and the phenol can be removed with a pipette. This process is repeated to remove the last trace of the alkaloids, the phenol washed by shaking with water, and then allowed to evaporate spontaneously. The amorphous residue is then treated with acidulated water which dissolves the alkaloid, and this solution, after being poured from the resinous mass which usually remains, evaporated to dryness. Absolute alcohol removes the narcein from the residue, and upon evaporation leaves it sufficiently pure for testing. In one experiment in which 0.05 grammes of narcein were mixed with food, 0.041 were recovered by this process.

Curarin can be obtained by exactly the same process. None, however, is dissolved by the amyl alcohol, that reagent serving only to remove impurities.

Poisoning by Nitro-benzine.—A case of nitro-benzine poisoning is reported in full by Dr. Robt. Bahrdt in the *Viereiljahrsch. f. Gericht. Med.* (April, 1872, from *Arch. d. Heilkunde*, 1871, p. 320), in a young man 19 years old, who, with others, prepared a kind of "schnaps" by mixing together one part of alcohol, two parts of water, and twenty drops of nitro-benzine. This mixture filled an ordinary wine bottle, and about one-third of the whole was taken by the patient between 7

and 8, A.M. The dose of nitro-benzine was, therefore, six or seven drops. Death occurred at 5½, P.M.

The most noticeable points in connection with the case were, that symptoms of poisoning did not appear until some time after taking the dose, a greyish-blue color of the skin, unconsciousness, deep brown color of the blood, the odor of bitter almonds in the breath before death and during the section of the body after death, and an apparent improvement in the symptoms after the transfusion of about sixty grammes of blood.

From the observation of this and several other cases of nitro-benzine poisoning, the author draws the following conclusions: 1. That even after fatal doses have been taken, a latent period of one or two hours is possible, during which time no symptoms of poisoning appear. 2. That this latent period does not appear to depend upon the form of the preparation, upon the amount taken, or upon the habits of the patient. 3. In the latent period a peculiar greyish-blue coloration of the skin takes place. 4. A strong, frequent pulse, faltering respiration, unconsciousness, which may come on suddenly or gradually, and dilatation of the pupils are constant symptoms of nitro-benzine poisoning. Vomiting and convulsions are usually present, but may be wanting. A temporary improvement even in fatal cases is possible. 5. That nitro-benzine poisoning differs from prussic acid poisoning chiefly in the slow appearance of the symptoms, in the greyish-blue coloration of the skin, and in the dark brown color of the blood, in cases of prussic acid poisoning the symptoms coming on suddenly, and the blood having a red color. 6. Early use of the stomach-pump, inhalation of ammonia, and transfusion of a large amount of blood are recommended. 7. That at the autopsy the odor of bitter almonds is always perceptible, the blood is dark brown and fluid, and cadaveric rigidity is very marked.

Urinary Chemistry.—A few words here in regard to the information as to the pathological changes taking place within the body which can be gained from the application of a few simple tests to the urine, such as every physician in active practice can perform in a few minutes with the aid of a small amount of apparatus and a very few reagents, may not be out of place; although it can by no means be said to form a part of the recent progress in urinary chemistry, which may be said to have assumed a scientific character since organic chemistry has made such immense progress, and since the improved methods of construction and observation with the microscope have been discovered, by which more accurate knowledge has been gained of the various processes of metamorphosis taking place in the system on the one hand, and of the anatomy and physiology of the kidney on the other.

It will be the object of the writer in the following very brief remarks to remove from the minds of many the erroneous impression, that the physician can obtain no useful information from an analysis of the urine unless he has at his command a well-stocked laboratory and elaborate apparatus, by mentioning some of the more important practical points in connection with urinary chemistry; for space will not permit of anything more than a mention of the common tests employed. A full description of them, and the precautions necessary to be observed in their performance, can be learned by consulting the ordinary text books on the urine.

The urine being a solution of the effete matters of the system, which are no longer necessary to the performance of the vital functions and which are consequently cast off by the system, contains them under normal circumstances in pretty constant quantity. Those products of metamorphosis, which are formed by the system normally, and are eliminated by the kidneys, are termed the "normal constituents" of the urine, and if these are found, by an analysis of the urine in any given case, to vary largely from the average amount, we may at once conclude that those processes by which they are produced are abnormally increased or diminished. Thus an increase in the metamorphosis of the nitrogenous tissues of the body attends all acute febrile diseases and is characterized by an increase in the urine of the products of the oxidation of these tissues, namely, urea and uric acid. Moreover, since uric acid is a lower product of oxidation than urea, if, for any reason, the process of oxidation is impeded, as in diseases of the lungs, a relatively larger amount of uric acid is produced, and therefore it is found increased in the urine: i. e., relatively to the amount of urea; some impediment to the process of oxidation of the nitrogenous tissues may then be diagnosticated. On the contrary, a very great diminution in the amount of urea, if of long continuance, leads at once to the suspicion of uræmic poisoning, and a daily examination is of special importance on that account in cases of renal disease. An empirical rule has been adopted for the estimation of urea, namely, to add four to the last two figures of the specific gravity. The sum represents the number of grammes eliminated in the twenty-four hours. Thus, the normal specific gravity being 1021, the number of grammes eliminated normally would be, according to the above rule, twenty-five (1 gramme=15.4 grains), which is about the average amount. Of course there are some exceptions to this rule, as in diabetes mellitus.

An increase in the amount of the coloring matters indicates either an increased metamorphosis of the blood globule, or a suppression of the only other colored secretion of the body, the bile. Thus, in cases attended with an increase in the decomposition of the blood globule, as acute fevers, scurvy, arseniuretted hydrogen poisoning, &c., the urine contains much coloring matter; in the last two cases, however, this coloring matter is chiefly an abnormal one, namely, hæmatin. The urine and the bile are the only colored excretions of the body; the liver and kidneys, therefore, are the organs which remove the products of metamorphosis of the coloring matters from the system. If, then, no pigment is removed by the liver on account of degeneration of that organ, an excess must be eliminated by the kidneys. The most important normal coloring matter of the urine, and the one to which the principal part of the color is due, is urophaein (Heller), the exact composition of which is uncertain, but it is probably a mixture of two or more distinct pigments, one of which has been isolated and is mentioned above (hydrobilirubin or urobilin). The exact pathology of uroxanthin, the other normal urinary pigment of Heller, is far from being determined, but practically it is found increased in renal diseases (especially acute nephritis and pyelitis), in diseases of the spine, and generally in disorders of the nervous system.

Important inferences can also be drawn from a determination of a diminution in the amount of chlorides in the urine, it being diminished in all acute fevers, especially if they are accompanied with exudation or diarrhœa; thus, in pneumonia the chlorides may be entirely absent

from the urine, the excess having been removed from the blood with the exudation, and their reappearance in the urine indicates commencing absorption of the exudation. In pneumonia, by testing the urine, this commencement of the absorption can be detected even before it can be detected by auscultation and percussion. An increase in the amount of the chlorides depends merely upon an increased ingestion of common salt, and is, therefore, of no importance.

An increase in the amount of the phosphates of the alkaline earths in the urine depends upon an abnormal metamorphosis of those tissues containing the earthy phosphates, such as the bones; hence in all extensive diseases of the bones, as osteomalacia, rachitis, &c., we find an increased amount of the earthy phosphates in the urine. In the same manner, an abnormal amount of sulphuric acid in the urine depends upon an abnormal oxidation of those constituents of the body which contain sulphur (provided we eliminate an increased ingestion of sulphates or substances containing sulphur as food or medicine), and is usually a symptom of acute fevers, which are attended with increased oxidation of such constituents, as albumen. This increase is noticed in the highest degree in meningitis, acute rheumatism, and also in affections of the muscular system.

In the analysis of the urine for the above substances, the importance lies in the amount excreted in a given space of time, as the twenty-four hours, and not in the relative amount in 1000 parts of urine, because in any diluted urine the normal constituents are relatively diminished, although the amount excreted may be absolutely increased. Hence the importance of always knowing the quantity of urine passed in the twenty-four hours, or at least in a definite space of time.

By the application of simple tests we can not only determine an increase or diminution of those constituents which are found in the urine normally, and hence draw inferences as to the general condition of the system, but we can also detect the presence of abnormal substances, when by the failure or faulty performance of certain functions they are produced, find their way into the blood and are eliminated by the kidneys, as is almost invariably the case when such substances are formed, and oftentimes the detection of abnormal substances gives us an exact or an approximative diagnosis. Thus the detection of grape sugar in the urine is diagnostic of diabetes mellitus, in which not only is the qualitative determination important, but also the quantitative, since it affords valuable information as to the progress of the disease and the result of treatment. The presence of biliary pigments indicates the existence of hepatic disease, functional or organic. Leucin and tyrosin, which are products of imperfect oxidation of nitrogenous substances, and indicate, when found in the urine, an exceedingly severe interruption to that process, are found in acute yellow atrophy of the liver, acute phosphorus poisoning, and sometimes in typhus fever and smallpox, and can be detected under the microscope by their crystalline form either in the sediment, in the residue after evaporating a drop of urine upon a glass slide, or in the precipitate produced by adding to the urine a large volume of alcohol, in which menstruum these substances are insoluble.

The presence of albumen in the urine occurs so frequently and may be caused by so many pathological conditions, that the test for it should never be omitted when the examination of the urine is at all important, it being produced by obstruction to the abdominal circula-

tion, as in tumors, ascites, &c.; also in cases attended with an anæmic condition of the blood, in all forms of renal disease, and in those local affections in which blood or pus may find their way into the urine.

The above brief sketch is intended to give an idea of the kind of information in regard to general diseases which can be obtained by the physician in a few moments, by the application of a few chemical tests to the urine, such as are indicated in the table below. In addition to this, the most exact information in regard to local affections of the urinary tract is often afforded by the chemical and microscopic examination of the urine. It is needless to refer to the value of the microscopic examination of the sediment in these diseases, as it enables us frequently to locate exactly the seat of the affection, and to determine the composition of a calculus the existence of which has been discovered by other means. The importance of the information gained by an accurate examination of the sediment, is usually stated to be double that of the chemical analysis of the liquid.

The following table, "Heller's Analysis of the Urine," which has been distributed to the medical classes at Harvard University for many years, is an excellent guide as to the important properties to be considered and substances to be tested for, and contains a list of the important constituents, and the most common test for each. It will be seen by an inspection of the table that the tests are simple, and the only apparatus required is a few test tubes, a wine glass, a spirit lamp, a urinometer and a microscope.

HELLER'S ANALYSIS OF URINE.

Physical Properties.

COLOR		
ODOR		
REACTION	Litmus. Turmeric.	
SP. GR.	Urinometer.	
SEDIMENT		

Normal.

UROPHÆINE	H_2SO_4 oz. ss.+Ur. gtt. 10.	Brown color.
UROXANTHINE	HCl oz. ss.+Ur. gtt. 30.	Amethyst color.
UREA	Ur. gtt.+HNO_3 gtt.	Nit. Urea Cryst.
URIC ACID	Ur.+$\frac{1}{8}$ HCl+24 hrs.	Uric acid Crystals.
CHLORIDES	Ur.+HNO_3+(Ag NO_3+8 Aq.)	Clumpy white ppt.
SULPHATES	Ur.+(Sat. Sol. $BaCl_2$+$\frac{1}{8}$ HCl.)	Ppt. within hr.
EARTHY PHOS.	Ur.+NH_4HO in excess.	" " "
ALKAL. PHOS.	Ur.–Earth. Phos. ppt. by NH_4HO filt. and add (Sat. Sol. $MgSO_4$ +HCl made Alk. by NH_4HO)	Precipitate.

Abnormal.

ALBUMEN	Heat or HNO_3	Coagulate.
BILE PIGMENTS	Ur. spread on plate+HNO_3 gtt.	Prismatic rings.
SUGAR	Ur.+$\frac{1}{2}$ Liquor Potassæ. Boil and let it cool.	Brown color.
URERYTHRINE	Ur.+HA+PbA_2	Fawn ppt.
BLOOD CORPUSCLES	By Microscope.	
PUS CORPUSCLES	" "	
CASTS	" "	

The tests are all qualitative ones, but by comparing the depth of color or quantity of precipitate with that produced in normal urine by the same treatment, and by always using the same amounts of urine and reagents in the tests employed, an approximative idea of the quantity of the normal constituents and of albumen may be obtained. This method of quantitative determination gives results which are by no means chemically accurate, but are sufficiently so to afford the physician some information as to the result of his treatment in certain cases, and valuable assistance in the diagnosis and prognosis of many diseases. It is needless to state, however, that exact quantitative estimations of certain urinary constituents are preferable, and the conclusions arrived at more exact and satisfactory. Such quantitative analyses can be easily performed in a few minutes with the requisite apparatus and reagents. Thus in the determination of sugar with Fehling's solution, of urea with a standard solution of mercuric nitrate, and of the chlorides with one of nitrate of silver, the only additional apparatus required is a pipette and a burette. Full descriptions of these tests are given in all of the ordinary text books and need not be repeated here.*

Bibliographical Notices.

Autumnal Catarrh. (Hay Fever.) With three Maps. By MORRILL WYMAN, M.D., late Hersey Professor Adjunct of the Theory and Practice of Medicine in Harvard University. New York: Hurd & Houghton. 1872. 8vo. Pp. 173.

DR. WYMAN, himself a victim to the odious, tormenting annual visitant which is the subject of his monograph, has entered upon its investigation with a truly patient and philosophical spirit. It would be irony indeed to say that he writes *con amore*, but it is no less true that a personal sense of the wretchedness of the victims of autumnal catarrh gives a zest to his investigations, and a thoroughness to his experiments, which would hardly have been looked for except from one who is himself a sufferer.

Dr. Wyman claims, and we think rightly, that he is the first medical writer to describe this annual autumn visitant to the eastern parts of the United States. Led by the suggestion of Dr. Bostock, who gave to the early summer complaint known in England as hay fever or hay asthma the name of *catarrhus æstivus*, he gives to the subject of his monograph the name of *catarrhus autumnalis*, or autumnal catarrh; which he shows, we think, quite conclusively, to be a strictly American disease. In popular language there is much confusion in the terms applied to this affection—rose cold, hay fever, hay asthma and the like being indifferently applied to any periodically recurring catarrhal affection coming on at any time from early summer to the beginning of autumn. Dr. Wyman takes particular pains to show that two dis-

* Writers of papers on Medical Chemistry and Toxicology will contribute much assistance in the preparation of these reports if they will forward copies of their papers, addressed to this JOURNAL.—EDS.

tinct disorders are thus confounded with each other—one beginning in the last week of May or first week of June and lasting until about the first week of July; the other coming on towards the close of August and continuing about six weeks, and being much the more severe affection of the two. As a rule, the sufferers from one of these complaints are free from the other.

We do not propose to describe this complaint in detail. Its title suggests to the medical reader the general characters of its symptoms, and we will only say that it attacks all the tissues and organs which are ever invaded by catarrh, usually passing through three stages, named by Dr. Wyman the catarrhal, the bronchial and the spasmodic; the last being characterized by a violent spasmodic cough, frequently accompanied by very severe asthma.

One of the most curious facts connected with this singular affection is the regularity of its annual return; many of its victims being attacked on the same date year after year, and none of them, after one seizure, ever escaping its visitation, if they continue to reside where they were first attacked. Its cause is a mystery, and is the subject of much speculation among its victims. Dr. Wyman himself is inclined to believe that it is connected in some way with vegetation, perhaps is due to some one widely distributed plant, but the evidence as yet is far from settling this point. Another singular fact is the cessation of the disease on the appearance of frost; the statistics collected by the author show conclusively that in most cases these events are almost simultaneous. One cannot but be reminded by this curious coincidence of the immediate disappearance of the malarial diseases of the southern portions of our country under the same conditions. In fact, the northern disease would seem to be in many respects the counterpart of those of the south; the mystery of its specific cause, the period of annual return, the exemption of certain localities from invasion, its cessation with the return of the cold season, presenting most striking features of resemblance.

With regard to the exact limits of the territory over which autumnal catarrh prevails in the United States, Dr. Wyman's researches as yet have not furnished him with a precise determination. His proximate results indicate that it is found on the Atlantic coast from the Capes of Virginia in latitude 37° N., to Eastport on the coast of Maine, latitude 45°. It is found as far west as St. Paul, Minnesota, latitude 45°, beyond which he has received no satisfactory evidence of its existence; the western line has been traced down to St. Louis, latitude 38° 37′.

Dr. Wyman discusses the question of the influence of residence upon the duration of this disease, showing that, with the exception of a single class of localities, there is no certain haven of refuge for its unhappy victims, where they can escape its regular visitations, or shake off the attack after it has seized them. The singular discovery has been made that there are certain localities about the White Mountains of New Hampshire where these unfortunates may find peace. These places are, as a rule, at a higher elevation than eight hundred feet above the sea level. On this interesting point we quote Dr. Wyman's own language:—

"The first person known by me to have been relieved by a visit to the mountains was a lady from Lynn, Mass. She had suffered severely, especially in the asthmatic stage. She accidentally noticed, in 1853,

while travelling in the White Mountain region, that her catarrh, which for twelve years had commenced August 20th, had failed to make its appearance. The following year she visited the same region before the usual time of attack, with the hope of escaping it. She did escape it. During the remaining ten years of her life, until 1864, she was at the Franconia Notch, White Mountain Notch, or at the Glen House—most of the time at the latter place. During this whole period she obtained complete relief. In 1860, Jacob Horton, Esq., of Newburyport, Mass., who had suffered so severely that he was obliged to keep his room during much of the attack, in answer to my inquiries, replied, 'the only relief for me is at the White Mountains.'

"These facts drew my attention to the probable value of mountain residence. Other instances of relief soon became known to me, and persons suffering from this malady were advised to repeat the mountain experiment. They did so, and were successful."

One of the most curious circumstances about this discovery is that this complete immunity from the disease is not equally distributed throughout the White Mountain region, but is confined to certain neighborhoods, and this without any appreciable influence of position to account for it. The line of division between them and those which furnish no protection is quite strongly marked, a ride of five or six miles being often sufficient to bring back the sufferer to a full consciousness of his misery. We cannot refrain from quoting Dr. Wyman once more, so graphic is his description of the comfort which these charmed spots afford to those who seek relief there.

"The change in a sufferer fully under the influence of his malady, on arriving at the mountains, is sudden and striking. His first night's sleep is refreshing, and in the morning his most annoying symptoms—the itching and watering of the eyes, the sneezing and nose-blowing, or the asthma—have much diminished. A second night is usually followed by a day in the course of which most of the symptoms disappear. If, however, the disease has continued until the mucous membrane of the nostrils and air-tubes has become irritated and thickened, the disappearance of the effects of these changes is gradual. Besides this relief of the local symptoms, a still greater change takes place in the spirits. Activity of mind and body replace discouragement and weakness, and the sufferer feels assured that he has at last shaken off his enemy."

It is a singular fact that the disease of which we are speaking is almost wholly confined to the classes who lead more or less sedentary lives. Of fifty-five cases in which Dr. Wyman gives the profession of the patient, all but six—a gardener, a carpenter, a butcher and three farmers—were of this class. His limited statistics also indicate that it belongs to the early and middle periods of life, and that males are twice as subject to it as females. It also runs in families; in one-fifth of the cases collected by Dr. Wyman, more than one member of the family being affected.

The sufferers from autumnal catarrh will turn with eagerness to the chapter on treatment, but will find, we are sorry to say, but little comfort there, so far as the efficacy of drugs is concerned. In fact, Dr. Wyman frankly says at once that no well-authenticated case has come to his knowledge in which the disease has been broken up in the midst of its career, or its annual return prevented by the use of medi-

cines. The only remedy as yet known is a resort to the localities we have spoken of, about the White Mountains. It is to be hoped, now that the medical profession have been brought, by the admirable treatise before us, to a distinct recognition of this disease as a specific affection, that the time is not far distant when a different condition of things may be true.

Dr. Wyman gives details of a good many cases, and closes with a tabular view of eighty-one in all. There are several valuable maps, so colored as to present very clearly the topography of the disease, and all through the work, mostly in the form of foot-notes, he gives, in the language of the patients themselves, most interesting and graphic details of the affection in its various forms. These are distributed in such a way as to add very much to the interest of the text, illustrating as they do the various shades of difference in different cases, and confirming the author's statements regarding the various features of the affection and its methods of attack. An over-fastidious critic in a cotemporary medical journal seems to think such material is quite out of place in a medical treatise—beneath the dignity of one who aspires to the honors of medical authorship. We disagree with him entirely. To our minds they are of great value, confirming the author's statements, and often by their piquancy and humor enlivening the professional sobriety of the text. No reader, we believe, except the critic aforesaid, would willingly spare, for instance, the exquisite humor, running sometimes into broad farce, of Henry Ward Beecher's doleful accounts of the misery he is called to endure once a year from this complaint, until he reaches his haven in the White Mountains. At the risk of compromising our professional dignity we cannot forbear copying a single passage which Dr. Wyman quotes from the *New York Ledger*. Describing his sufferings, he says:—

"The nose sympathizes. Your handkerchief suddenly becomes the most important object in life. By the next day the slightest draft of wind sets you to sneezing. It is a revelation. You never before even suspected what it was to sneeze. If the door is open, you sneeze. If a pane of glass is gone, you sneeze. If you look into the sunshine, you sneeze. If a little dust rises from the carpet, or the odor of flowers is wafted to you, or smell of smoke, you incontinently sneeze. If you sneeze once, you sneeze twenty times. It is a riot of sneezes. First, a single one, like a leader in a flock of sheep, bolts over; and then, in spite of all you can do, the whole flock, fifty by count, come dashing over, in twos, in fives, in bunches of twenty."

We thank Dr. Wyman for his book, and think he has done his work well; and sincerely hope it will lead to such diligent study of the subject of which it treats that each sufferer may soon have a remedy at his own door.

S. L. A.

THAT clerical and lay functions were once conjoined, the following old-time advertisement will sufficiently show: "Wanted, for a family who have had bad health, a sober, steady person in the capacity of doctor, surgeon, apothecary and man-midwife. He must occasionally act as butler, and dress hair and wigs. He will be required sometimes to read prayers, and to preach a sermon every Sunday. A good salary will be given."—*Medical Times.*

Boston Medical and Surgical Journal.

BOSTON: THURSDAY, JANUARY 9, 1873.

THE following communication to the *Boston Daily Advertiser* of the 4th inst. is reproduced in this connection because we wish to endorse it as presenting a scheme for a Board of Health which, we believe, will meet with favor from the whole medical profession. The initials of the writer will be recognized as those of a medical gentleman exceptionally expert in sanitary matters; if the scheme which he presents could have the advantage of his practical aid in its realization, the exigencies of public health in this community would be very fully met.

The plan is one fitted not only for the sanitary needs of Boston, but for those of every city of considerable size in the country.

"Everybody now admits that an independent Board is needed in Boston to protect the public health, and a great many people wonder why the ordinance recently adopted by the city authorities is not immediately put in operation. . . . . .

"It is now quite evident that the new law is in itself responsible for the delay. A careful reading of the ordinance will show that the powers of the proposed Board are by no means commensurate with their responsibilities. The cleaning of streets, alleys and passage-ways, the removal of house offal and of ashes are retained by a committee of the Board of Aldermen. No competent Board of Health would willingly be held accountable for the proper execution of these important duties unless all details of their performance were under their direction. How important they are in a sanitary view of the matter needs no discussion. . . . . .

"Another difficulty with the law may be found in the provision that members of this Board shall give up all other active business. Men whom the public would trust with the protection of the city from avoidable disease are generally earning, in some way, at least as much money as would be offered them in this position. . . . . .

"We venture to suggest a general plan which would avoid some of the difficulties to which we have referred. Let us suppose that the deliberative and executive duties could be divided. A Board of five members, consisting of a physician, a lawyer, a merchant, an engineer and a chemist, could probably be organized on a basis which would command the confidence of the public, both for their ability to deal with questions affecting public health, and their integrity in the disposal of the large sums which are required to secure it. They would consider all matters relating to health and pass the necessary orders. Their cares would be great at the outset, until the system was fully arranged, but afterwards they would not be very onerous. Their payment might be on a liberal scale, for the time actually employed in these duties, and would not, probably, exceed a thousand dollars a year for each member.

"The executive department should have at its head a physician of skill and tact, fully acquainted with sanitary science and appointed by the Board to carry out its orders, and also to keep the Board

informed of every danger to public health, both present and prospective. This officer should be liberally paid, and made to feel secure in his office while his duties were faithfully performed. He might have a corps of "medical officers of health," one in every ward, whose business it would be to make known to their chief by daily reports the condition, needing amendment, of every street, yard, cellar and privy; the existence of any epidemic, of every case of infectious disease, of every form of nuisance; the condition of all tenement houses, stables, markets, of premises used for offensive trades, of undrained lands; the sale of articles of food dangerously adulterated or spoiled; and be always on the watch for causes of preventable disease. Such service might readily be secured from intelligent workers among the younger physicians, for a few hundred dollars a year each, since it would not in any way interfere with the study or practice of their profession. A deputy executive officer would be needed—perhaps more than one—and as many clerks as are now employed. A superintendent of city stables and teams would also be required, as at present.

"By this plan the old machinery of consulting physicians, superintendent of health and city physician might be dispensed with. The result of some such division of duties as we have indicated would be the establishment of an harmonious, efficient and practicable system.

G. D."

Influence of Education on Public Health.—In 1827, Double noticed the influence which education exercised on the public health; and, a year later, Melier showed that in those departmnts of France where the numbers of children at school were greatest the mortality was least, with a few exceptions which could be explained by the action of special influences. M. Du Mesnil has recently again investigated the subject, and has given the results of his observations in the *Annales d'Hygiene Publique*. From a comparison of the reports on recruiting for the army with those on the progress of education, he has found that those departments in which the proportion of illiterate persons is greatest, present also the lowest duration of life, and the smallest average stature; while, in those where primary instruction is most completely carried out, the people live longer and are of larger build. He finds, also, that the number of recruits rejected as unfit for military service is greatest in those departments, where education is most neglected. —*British Medical Journal.*

Tea Adulteration.—The *North British Daily Mail* has published analyses of thirty-five samples of tea bought in different parts of Glasgow. Out of the thirty-five samples analyzed—twenty-seven of which were of black and eight of green tea—only six were unadulterated. All were high-priced, and none of the six was a sample of green tea. One sample contained *no tea at all*, so far as the analyst could discover. The adulterants which were used in this and the other twenty-eight cases were iron, plumbago, chalk, china clay, sand, Prussian blue, turmeric, indigo, starch, gypsum, catechu, gum, and leaves of various kinds, elm, oak, willow, poplar, elder, beech, hawthorn and sloe. It is but justice to the retail venders to state that the adulteration is not supposed to be their work; it is largely done in China, and is further carried on after the "tea" has reached Britain.

Medical Miscellany.

THE LABORATORY AT THE ROYAL INSTITUTION, LONDON.—During the absence of Professor Tyndall in America, the opportunity is being taken to rebuild the laboratories of the Royal Institution on a considerably enlarged scale.

IN JAPAN are four chemical laboratories where chemistry is taught to the natives. Three of them are conducted by Germans, and the fourth by an American. Another is nearly opened at Jeddo.

A LOSS TO SCIENCE. The following is a despatch to a Boston paper:—"*Halifax, Dec.* 21. Wm. Wately (colored), steward of the brig Union Star, having a disagreement with his captain, a few days ago, attempted to burn the vessel and kill the officers and crew. He stupefied all hands while they were sleeping, with muriatic acid, and then set fire to the vessel in the hold. Before he could extricate himself he was suffocated by smoke. The captain awakened in time to arouse the crew and extinguish the fire. Wately was the only person who lost his life."

It is to be regretted that Mr. Wately should have been thus prematurely cut off before publishing his investigations of the properties of muriatic acid.

PREGNANCY AT AN ADVANCED AGE.—Dr. Turner Anderson reported to a recent meeting of the Louisville College of Physicians and Surgeons the case of a woman delivered at the age of fifty-one of a still-born child at full term. She had given birth to a living child seven years before; since that time, she had menstruated irregularly. She was exceedingly thin, and her hair was white. Dr. Speed gave details of the case of a lady aged fifty-three, whose youngest child was nine years old.

EATING DIRT.—It is a common opinion that even in the most civilized communities it is not easy to avoid one's peck of dirt; and some individuals manifest quite a peculiar talent for it, and go through the operation with a readiness and grace which seem to imply a suppressed inclination for the practice. Dr. Frank Galt, of Iquitos, Peru, describes quite a devouring passion for it to prevail among the mestizos, or half-breeds of the Upper Amazon. His account is very interesting.

"Dirt-eating" he says "becomes an irresistible passion with these people. Even strangers, English, or the white Peruvian, who have married with the mestizo, and have had children by them, find its presence among their little ones the plague of their life; and the accounts one hears about the tyranny of this habit of dirt-eating on the victims of it would seem almost fabulous, were there not evidences all around one to give sanction to them. Children commence the habit from the time they are 4 years old, or less, and frequently die from the results in two or three years. In other cases, they grow to manhood or womanhood with the "appetite growing by what it feeds on," and I have seen here myself, in the case of a mestizo soldier, who was dying from the dysentery which generally, sooner or later, supervenes on this habit, the poor creature, half an hour before his death, detected with a lump of clay stuffed in his sunken cheeks, which he had dragged from the wall near where he was almost breathing his last. Officers here, who have the Indian or half-breed children as servants in their employ, sometimes have to use wire masks to keep them from putting the clay to their mouths; and women, as they lie in bed sleepless and restless, will pull out pieces of mud from the adjoining walls of their room to gratify their strange appetite, or will soothe a squalling brat by tempting it with a lump of the same material. If persisted in, the effects are surely fatal, at varying terms of years, some living tolerably to middle age, and then dying with dysentery, or from that disease at an earlier period. In the children dropsy is usually the most prominent apparent cause of decline and death."—*Brit. Med. Jour.*

THE following, concerning the City Board of Health, is an extract from His Honor Mayor Pierce's address to the City Council, delivered Jan. 6th—

"The members of that board have not yet been appointed. Prompt action is urgently demanded, and I shall take the earliest opportunity to make nominations for your approval.

"The office is one of great importance and responsibility at all times; but it is especially so at this time on account of the prevalence of smallpox. The efforts made during the past year for the suppression of this dangerous epidemic have been entirely inadequate to the emergency. It has now assumed serious proportions, and I trust the citizens will recognize and cheerfully submit to the necessity of using more stringent measures than have yet been adopted.

"The hospital which has just been constructed is not large enough to furnish the accommodations required at this time. It is necessary that steps should be taken immediately to provide an additional hospital for temporary use. The first section of the new health ordinance provides that the mayor shall be vigilant and active in protecting the public health, and shall see that the laws and ordinances in relation to the same are enforced. Acting upon this general authority, I shall consider it my duty to aid and assist in every proper way those who are specially charged with the preservation of the public health; and in cases of emergency to exercise the paramount authority conferred by the charter upon the chief executive officer of the city."

NOTES AND QUERIES.

CORRESPONDENTS, who wish notice to be taken of their communications, should authenticate them with their names. "Warren" will please notice.

LEAD POISONING.—Our correspondent is referred, for a full discussion of the subject, to the report of the Massachusetts State Board of Health for 1871. Various text-books, as, for example, Tanquerel, Niemeyer, Aitken, and Flint, also give valuable and practical information on the same subject.

A CORRESPONDENT, "HAY CUTTER," asks:—"Can parts completely dissevered ever be united?" We invite from our readers the communication of any facts which will shed light on this inquiry.

PAMPHLETS RECEIVED.—Peculiarities in the Operations of the three great Ovariotomists: Wells of London, Atlee of Philadelphia, and Thos. Keith of Edinburgh. By S. Fitch, M.D., Edinburgh. Philadelphia: J. B. Lippincott & Co. 1872. Pp. 16.

MARRIED,—In this city, Dec. 31, Dr. John P. Ordway to Miss Ellen McGee.—Dec. 31, Dr. A. T. Davison to Miss Lucy Kelley, both of South Boston.—Jan. 1st, Dr. Ira L. Moore to Charlotte M. Aldrich, daughter of Daniel Chamberlin, Esq.—In New Bedford, 25th ult., Dr. Chas. B. Belt, of Boston, to Mary E. Tompkins, of Little Compton, R.I. [No Cards.]

MORTALITY IN MASSACHUSETTS.—*Deaths in fifteen Cities and Towns for the week ending December 28, 1872.*

Boston, 167—Charlestown, 13—Worcester, 21—Lowell, 17—Milford, 4—Cambridge, 20—Salem, 11—Lawrence, 9—Springfield, 6—Fitchburg, 5—Taunton, 4—Newburyport, 6—Somerville, 2—Haverhill, 6—Holyoke, 3. Total, 294.

Prevalent Diseases.—Smallpox, 71—consumption, 39—pneumonia, 27—croup and diphtheria, 13—typhoid fever, 8—scarlet fever, 8.

The deaths from smallpox were as follows: In Boston sixty-three, Cambridge five, Charlestown two and Holyoke one.

GEORGE DERBY, M.D.,
Secretary of the State Board of Health.

DEATHS IN BOSTON for the week ending Saturday, January 4th, 204. Males, 113; females, 91. Accident, 4—abscess, 2—apoplexy, 1—anæmia, 1—bronchitis, 2—inflammation of the brain, 1—congestion of the brain, 2—disease of brain, 11—cerebro-spinal meningitis, 1—cancer, 4—cyanosis, 4—consumption, 34—convulsions, 5—croup, 3—debility, 1—dropsy, 2—exposure, 1—eczema, 1—erysipelas, 1—remittent fever, 1—scarlet fever, 10—typhoid fever, 7—gastritis, 1—disease of heart, 3—intemperance, 2—disease of kidneys, 4—disease of the liver, 1—inflammation of the lungs, 9—marasmus, 6—measles, 1—old age, 4—paralysis, 2—pleurisy, 2—puerperal disease, 3—smallpox, 60—syphilis, 1—thrush, 1—tumor, 1—tetanus, 1—unknown, 3.

Under 5 years of age, 73—between 5 and 20 years, 20—between 20 and 40 years, 62—between 40 and 60 years, 29—over 60 years, 20. Born in the United States, 137—Ireland, 43—other places, 24.